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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/598,394	08/15/2008	Richard Root Woods	073358-050101/US	3588

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GREENBERG TRAURIG LLP (LA)  
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INTELLECTUAL PROPERTY DEPARTMENT  
Chicago, IL 60601

EXAMINER
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HANDAL, KAITY V

ART UNIT	PAPER NUMBER
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1723

NOTIFICATION DATE	DELIVERY MODE
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06/24/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

laipmail@gtlaw.com  
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cadanoc@gtlaw.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/598,394	<b>Applicant(s)</b> WOODS ET AL.	
	<b>Examiner</b> KAITY HANDAL	<b>Art Unit</b> 1723	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. ____.                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/24/08;9/25/07</u> .   | 6) <input type="checkbox"/> Other: ____.                          |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-8 and 16-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Mulvaney, III et al. (US 6,159,358).

With respect to claim 1, Mulvaney teaches an apparatus comprising:  
a planar assembly (Figures 3-5) including a reformer zone (Fig. 4, 29), a combustion zone (49) (col. 9, lines 6-25), an inlet reformat process fluid manifold (lines 11 & 19), an outlet reformat process fluid manifold (31 & 33 & 15'), an inlet combustion fluid manifold (33' & 34', 33, 35), an outlet combustion fluid manifold (48), an inlet reformat process fluid flow passage (21) connecting the inlet reformat process fluid manifold (lines 11 & 19) and the reformer zone (29), an outlet reformat process fluid flow passage (25) connecting the reformer zone (29) and the outlet reformat process fluid manifold (31 & 33 & 15'), an inlet combustion fluid flow passage (47) connecting the inlet combustion fluid manifold (33' & 34', 33, 35) and the combustion zone (49), and an outlet combustion fluid flow passage (45) connecting the combustion zone (49) and the outlet combustion fluid manifold (48) (col. 9, lines 1-24; col. 10, lines 50-62; col. 11, lines 1-15; col. 13, lines 24-30).

With respect to claim 2, Mulvaney teaches wherein said reformer zone and combustion zone are in thermal contact (as illustrated in Figure 2).

With respect to claim 3, Mulvaney teaches wherein said reaction is a reformation reaction that produces at least hydrogen as a product of said reaction (col. 9, lines 1-24; col. 10, lines 50-62).

With respect to claim 4, Mulvaney teaches wherein a primary reactor zone is provided, consisting of said reformer zone (Figure 6, 29) and said combustion zone (49), centrally located within said assembly (as illustrated).

With respect to claim 5, Mulvaney teaches wherein a plurality of planar assemblies are stacked one atop the other to provide a modular reformer assembly of one or more individual assemblies (as illustrated in Figure 6).

With respect to claim 6, Mulvaney teaches wherein said inlet reformat process fluid flow passage (Figure 3, 21) is in thermal contact with said outlet reformat process flow passage (25)/(via fluidly connecting the inlet reformat process fluid flow passage (21) to inlet (11) and fluidly connecting the outlet reformat process flow passage (25) to outlet (15) such that inlet (11) and outlet (15) are in thermal contact (as illustrated).

With respect to claim 7, Mulvaney teaches wherein said inlet reformat process fluid flow passage (21) is located circumferentially within the assembly (as illustrated in Figure 3).

With respect to claim 8, Mulvaney teaches wherein inlet combustion fluid flow manifold (33' & 34') is divided into an inlet combustion air manifold (34') and an inlet combustion fuel manifold (33').

With respect to claim 16, Mulvaney teaches wherein one or more of said inlet reformat process fluid manifold, an outlet reformat process fluid manifold, an inlet combustion fluid manifold, an outlet combustion fluid manifold is external to said planar assembly (as illustrated in Figure 3).

With respect to claim 17, Mulvaney teaches wherein said the assembly is constructed of sheet metal components (col. 11, lines 39-51).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulvaney, III et al. (US 6,159,358), as applied to claim 1 above, and further in view of Kawasumi et al. (US 2002/0045078).

With respect to claim 9, Mulvaney discloses all claim limitations as set forth above but fails to teach wherein said inlet combustion fluid flow passage is divided into an inlet combustion air passage and an inlet combustion fuel passage; however, it is well known in the art to do so as evidenced in Kawasumi. Kawasumi teaches an

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apparatus comprising a combustor (11) upstream a reformer (13) wherein the inlet combustion fluid flow passage is divided into an inlet combustion air passage (32) and an inlet combustion fuel passage (23) (as illustrated). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have the inlet combustion fluid flow passage of Mulvaney divided into an inlet combustion air passage and an inlet combustion fuel passage since it is well known in the art to do so as evidenced by Kawasumi.

Regarding limitations recited in claim 9 which are directed to a manner of operating a disclosed device, neither the manner of operating a disclosed device nor material or article worked upon (i.e. fuel, air, etc.) further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states “Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim.”

5. Claims 10-15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulvaney, III et al. (US 6,159,358), as applied to claim 1 above, and further in view of DeBellis et al. (US 2002/0131919).

With respect to claim 10, Mulvaney discloses all claim limitations as set forth above including providing a manifold (11) of natural gas and steam mixed together but fails to teach wherein said inlet reformat process fluid manifold is divided into an inlet

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water/steam manifold and inlet fuel/water/steam manifold; however, it is well known in the art to do so as evidenced in DeBellis. DeBellis teaches an apparatus comprising modular operating units including a plate fuel reformer (Figure 5) wherein an inlet reformat process fluid manifold is divided into an inlet water/steam (air) manifold and inlet fuel/water/steam manifold (as illustrated in Figure 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have the inlet reformat process fluid manifold of Mulvaney divided into an inlet water/steam manifold and inlet fuel/water/steam manifold since it is well known in the art to do so as evidenced by DeBellis. The plate reformer of DeBellis comprises three inlets, therefore, one skilled in the art can choose to connect the reformer inlets to the desired reactant material sources.

Regarding limitations recited in claim 10 which are directed to a manner of operating disclosed device, neither the manner of operating a disclosed device nor material or article worked upon (i.e. fuel/water/steam etc.) further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim." Though DeBellis's apparatus is receiving water mixed with fuel in two inlets and air in a third inlet, it is obvious that one skilled in the art can connect the air inlet to a water inlet

depending on what is needed for the specific reforming reaction taking place within the reformer.

With respect to claim 11, Mulvaney discloses all claim limitations as set forth above including providing a manifold (11) of natural gas and steam mixed together but fails to teach wherein said inlet reformat process fluid flow passage is divided into an inlet water/steam passage and inlet fuel/water/steam manifold; however, it is well known in the art to do so as evidenced in DeBellis. DeBellis teaches an apparatus comprising modular operating units including a plate fuel reformer (Figure 5) wherein an inlet reformat process fluid flow passage is divided into an inlet water/steam (air) manifold and inlet fuel/water/steam manifold (as illustrated in Figure 4). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to have the inlet reformat process fluid flow passage of Mulvaney divided into an inlet water/steam passage and inlet fuel/water/steam manifold since it is well known in the art to do so as evidenced by DeBellis. The plate reformer of DeBellis comprises three inlets, therefore, one skilled in the art can choose to connect the reformer inlets to the desired reactant material sources.

Regarding limitations recited in claim 11 which are directed to a manner of operating disclosed device, neither the manner of operating a disclosed device nor material or article worked upon (i.e. fuel/water/steam etc.) further limit an apparatus claim. Said limitations do not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115. Further, process limitations do not have patentable weight in an apparatus claim. See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that



states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

Though DeBellis's apparatus is receiving water mixed with fuel in two inlets and air in a third inlet, it is obvious that one skilled in the art can connect the air inlet to a water inlet depending on what is needed for the specific reforming reaction taking place within the reformer.

With respect to claim 12, DeBellis further teaches wherein said inlet water/steam passage and said inlet fuel water/steam manifold are connected prior to entering said reformer zone (as illustrated in Figure 4).

With respect to claim 13, DeBellis further teaches wherein said outlet reformat process fluid flow passage is divided into any one of a pre-shift flow passage, a shift reactor (Fig. 4, 38), and a post shift flow passage (as illustrated)

With respect to claim 14, DeBellis further teaches wherein said pre-shift flow passage or said post shift flow passage are single or multiple passages connecting said outlet reformat process fluid manifold and a primary reactor zone/shift reactor (38/40).

With respect to claim 15, DeBellis further teaches wherein said pre-shift flow passage and said post shift flow passage are both provided in a configuration such that flows therein flow concordantly in same general direction within said planar assembly (as illustrated in figure 4, 38).

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6. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Mulvaney, III et al. (US 6,159,358), as applied to claim 1 above, and further in view of Marianowski et al. (US 5,227,256).

With respect to claim 18, Mulvaney discloses all claim limitations as set forth above including wherein the reactor plates are made of metal, Mulvaney is silent as to having at least one of said an inlet reformat process fluid flow passage, outlet reformat process fluid flow passage, inlet combustion fluid flow passage, reformer zone and combustion zone are created by pressed sheet metal components. However, it is well known in the art to do so as evidenced by Marianowski. Marianowski teaches a plate reactor comprising reformer plates that are pressed metal plates (see claim 36). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a plate reactor comprising pressed reformer plates in Mulvaney's apparatus, since it is well known in the art to do so as evidenced by Marianowski.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAITY HANDAL whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Neckel Alexa can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/KAITY V. HANDAL/  
Primary Examiner, Art Unit 1723

6/18/2011

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